

# Route & Network Optimization for Shippers

## A Glance at Clean Freight Strategies

Trucks for Associated Food Stores travel nearly 8 million miles annually, network optimization software indicated that it should move its distribution center 50 miles north of its location. By relocating and using route planning, the company reduced its fleet size by 38 percent. It also reduced annual travel by 400,000 miles, eliminated two to three routes daily, and improved on-time performance by 96 percent<sup>1</sup>. A reduction of 400,000 miles, assuming about 6.5 miles per gallon for tractor/trailer combinations, would save about 62,000 gallons of fuel annually and reduce carbon dioxide by 626 metric tons<sup>2</sup>.

*Route and network optimization can help you manage transportation costs, lower carbon emissions, and move goods more efficiently.*

### What is the Challenge?

Shippers establish inbound and outbound lanes and continually adjust the routing of freight as marketplace conditions change. Fuel availability and cost considerations are key determinants for establishing routes. By keeping abreast of fuel supply and price within your delivery and pickup areas, you may lower fuel costs while ensuring that fuel is available for your vehicles with minor route modifications. Weather, traffic, construction, and last-minute customer requests are also reasons why you might alter a route in order to eliminate empty miles, maximize driver and equipment utilization, improve service levels, and lower fuel consumption and emissions.

Similarly, the design of your distribution network is influenced by conditions including proximity to customers, inventory requirements, and access to highways, rail yards, and ports. A new inventory strategy, the relocation of a customer, changes in freight infrastructure, or rules that affect the distance a driver can cover in a certain time period may require a change to your distribution network. Unlike route optimization, which is sometimes done on the fly for short-term benefits, optimizing a distribution network typically requires substantially more planning and financial commitment.

### What is the Solution?

Both route and network optimization can help reduce vehicle miles, resulting in reductions of greenhouse gases (GHGs) and other pollutants, as well as fuel savings.

The key issues to analyze include the location of end users, suppliers, and your partners within the supply chain; the origin of orders; the location of distribution centers and warehouses; and your fulfillment and delivery capabilities.

Perhaps the most effective tool for both route and network optimization is a Transportation Management System (TMS)<sup>3</sup> working in concert with Enterprise Resource Planning (ERP) software. These systems can help you optimize your routes, procure the most resource-efficient carriers and modes of transportation, and make decisions based on meaningful data.

For example, an ERP allows you to maintain records of actual weight, dimensions, and volume for all the products you ship (including the packaging). You can record actual payload (i.e., gross weight, including product, package, and pallet weight), not just an estimate. Using your TMS, you can check invoiced miles against the route/mileage software, compare invoice payload against product weight in the ERP, and compare actual payload data from the carrier against product weight recorded in the ERP. As a result, you can design routes and orient elements in your supply chain to be more efficient and productive.

In response to shippers who state that GHG emissions are a factor in their transport decisions<sup>4</sup>, TMS providers now include functions that can help you collect, manage, and verify the quality of your supply chain data. This TMS-verified data can be used in a complementary fashion with the SmartWay Tool. These functions further extend the value of your TMS to include greater utilization of equipment and more control over your supply chain's carbon footprint.

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## A Glance at Clean Freight Strategies *Continued*

### Costs

The cost to license and deploy a TMS with routing and network optimization features will vary widely depending on the scale and complexity of your supply chain, the type of goods you move, and your existing IT infrastructure.

### Savings and Benefits

The intended benefits of route and network optimization are the same: they're tools to help you manage your supply chain with greater efficiency and lower cost. Concurrently, utilizing both strategies assists with the goal of reducing vehicles miles, resulting in reductions of greenhouse gases and other pollutants. Some examples include:

- Subway reevaluated its distribution network and made a series of changes that saved more than 9 million truck miles, 1.6 million gallons of diesel fuel, and nearly 17,000 shipments per year. For example, rather than send one pallet of ham from one supplier to 60 distributors, the company created redistribution points to consolidate outbound shipments. It now sources truckloads of ham, consolidates them with other proteins, and sends full truckloads of mixed goods to regional locations. It collaborates with suppliers to make distribution more efficient. For instance, a supplier of salad packaging moved a facility 1,000 miles closer to the company's redistribution center, annually saving more than 1 million truck miles and reducing carbon emissions by 1,663 metric tons<sup>5</sup>.
- United Parcel Service (UPS) devised route-optimization plans to be more efficient, reduce fuel consumption, and enable drivers to get back to their distribution centers earlier. By minimizing (and in some cases eliminating) left-hand turns, the company was able to more than meet its goals. Since 2004, the company has saved an estimated 10 million gallons of gas, and reduced carbon emissions by 100,000 metric tons. That's the equivalent of 5,300 cars off the road for an entire year<sup>6</sup>.
- Ocean Spray and Tropicana added new manufacturing and distribution centers in Florida and re-evaluated its national distribution network given the new facilities. By re-routing existing delivery paths, the company reduced driving by 4.5 million miles annually, saving 14,000 tons of carbon dioxide emissions – a 17 percent reduction<sup>7</sup>.
- According to EDF's Green Freight report, the retail company Tuesday Morning changed its goods movements and is reaping the benefits. Previously, all containers were moved from the Port of Los Angeles to the company's Dallas distribution center and then distributed to the company's over 800 store locations. Now, a portion of the product gets shipped directly to nearly 40 percent of its store locations instead of being routed through Dallas. The distribution network changes saved time, cost, and prevented the emissions associated with the Los Angeles to Dallas trip<sup>8</sup>.

## NEXT STEPS

**1** Audit your routes and network to determine a baseline performance level for services and costs.

**2** Seek out TMS vendors for product demonstrations. Determine the suitability, return on investment, and potential impact on the efficiency of your operations.

**3** For the routing module, conduct a trial to see how it performs in everyday conditions and extraordinary situations such as heavy traffic, bad weather, and route closures. For the network module, compare your current network to alternatives using "what-if" scenarios to determine potential benefits of using the software.